AI Planning
Exercise Sheet 3

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Exercise 3.1

See hand written notes.

Exercise 3.2

(d=dancing, h=at-home, w=work, ro=romeo, ju=juliet)
We start at: $\gamma = ju\text{–}d \wedge ro\text{–}h$
We want to reach: $I = \{ro\text{–}h \mapsto 1, ju\text{–}h \mapsto 1\}$
Operators: *go–d*, *go–w*, *go–h*

$$
\begin{aligned}
&regr_{go\text{–}w}(\gamma) = ro\text{–}h \wedge \\
&\quad ((EPC_{ju\text{–}d}(e_{go\text{–}w}) \vee (ju\text{–}d \wedge \neg EPC_{\neg ju\text{–}d}(e_{go\text{–}w}))) \wedge \\
&\qquad (EPC_{ro\text{–}h}(e_{go\text{–}w}) \vee (ro\text{–}h \wedge \neg EPC_{\neg ro\text{–}h}(e_{go\text{–}w}))) \\
&\quad) \wedge \kappa \\
&regr_{go\text{–}w}(\gamma) = ro\text{–}h \wedge \\
&\quad ((\bot \vee (ju\text{–}d \wedge \top)) \wedge \\
&\qquad (\bot \vee (ro\text{–}h \wedge \bot)) \\
&\quad) \wedge \kappa \\
&regr_{go\text{–}w}(\gamma) = \bot
\end{aligned}
$$

$\Rightarrow \gamma$ is not reachable by means of *go–w*

$$
\begin{aligned}
&regr_{go\text{–}h}(\gamma) = ro\text{–}w \wedge \\
&\quad ((\bot \vee (ju\text{–}d \wedge \top)) \wedge \\
&\qquad (EPC_{ro\text{–}h}(e_{go\text{–}h}) \vee (ro\text{–}h \wedge \neg EPC_{\neg ro\text{–}h}(e_{go\text{–}h}))) \\
&\quad) \wedge \kappa \\
&regr_{go\text{–}h}(\gamma) = ro\text{–}w \wedge \\
&\quad ((\bot \vee (ju\text{–}d \wedge \top)) \wedge \\
&\qquad \top \\
&\quad) \wedge \kappa \\
&regr_{go\text{–}h}(\gamma) = ro\text{–}w \wedge ju\text{–}d
\end{aligned}
$$

$\Rightarrow \gamma$ is reachable from $ro\text{–}w \wedge ju\text{–}d$ by means of *go–h*

//Note: less verbose from this point onwards.

$regr_{go\text{–}d}(\gamma) =$